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Practical : How to apply sampling techniques

7th practical lecture

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What is Sampling ?

Sampling is the process or technique of selecting a study sample of appropriate characteristics and of adequate size.

Population

group of things (people) having one or more common characteristics

Population:

a set which includes all measurements of interest to the researcher
(The collection of all responses,measurements, or counts that are of interest)

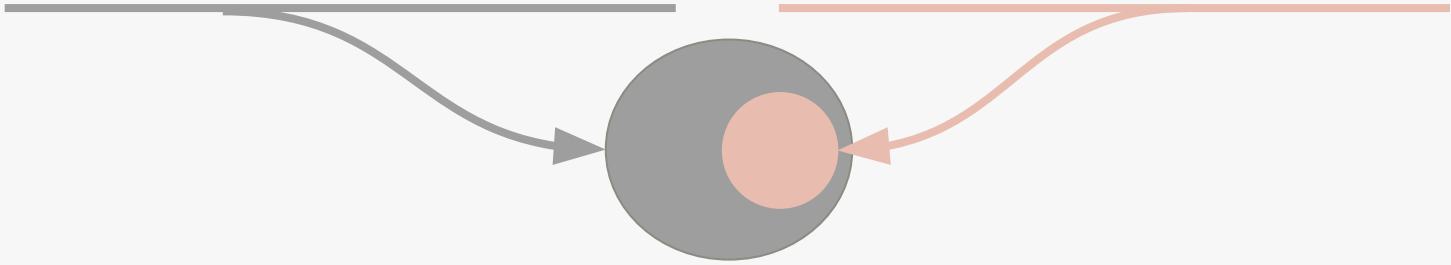
Sample

representative subgroup of the larger population

- Used to estimate something about a population (generalize)
- Must be similar to population on characteristic being investigated

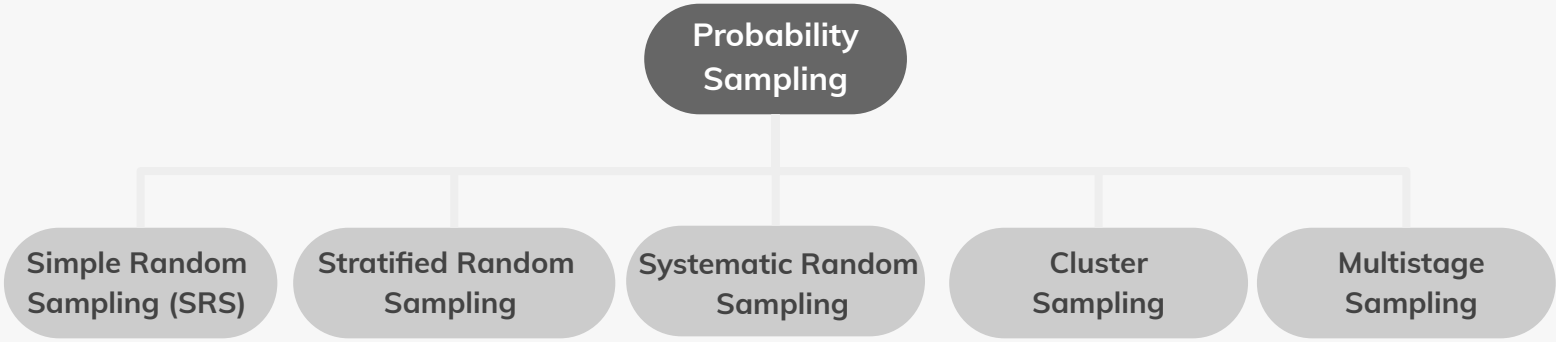
Sample:

A subset of the population



How to select a simple random sample

1. Define the population
2. Determine the desired sample size
3. List all members of the population or the potential subjects



How To Apply Sampling Techniques

1 What do you mean by 'sample' and population? Explain with a simple example.

A small portion/group of subjects selected from a wider group of subjects is called a **sample**.
This wider group is called **population**.

Example: In particular hospital 1000 deliveries occurred in particular year and out of these we take 100 deliveries for our research study. These 1000 deliveries is our population and these 100 deliveries is our sample.

مثال: انا ابي ادرس عن مضاعفات الأنسولين
General population (T2DM patients) >Patients who use insulin > accessible population(ksumc) >sample

2 Why do you study only a sample of patients? Write down points only.

- To facilitate Data collection that we use for research analysis particularly when the population being studied is larger.
- To save money and time
- Sampling permits you to draw conclusions about complex situations.
- To obtain enough data to answer the research questions without having to query the entire population

3

a) What do you call that sample where subjects are selected as you wish?
b) What do you call that sample where subjects are selected without any bias?

a) Convenience sample (non-random sample)
b) Random sample

4

Give names of some of the random sampling techniques you know.

- simple RS ,Stratified RS ,Systematic RS ,Cluster RS , Multistage RS.

How To Apply Sampling Techniques

Study No. 1

In a big hospital, every year 500 cases of MI (myocardial infarction) are reported. We want to study their physiological profile-their BP, cholesterol level, lipoprotein level, BMI, etc. Resources permit us to do investigations only for 50 cases. How do you select a simple random sample(SRS) of 50 cases out of these 500 cases. Explain the crude way as well as easy way to select this sample.

We will write ID numbers of these 500 cases in 500 similar looking slips and roll them and put in a bowl and shuffle well and then take 50 slips one by one. The patients whose ID numbers are picked up is our sample. This method of sampling is called **simple random sampling.** This is the **crude way** and difficult to do.
Easy way is take 50 random numbers within 1 to 500 from the computer or form the random number tables and the patients whose ID numbers are selected, will be our sample.

- crude (lottery) نكتب أسماءهم بورقة ونختار عشوائي
- Easy way: random number table موجود شرحها بالمحاضرة النظريه

Study No. 2

A researcher wants to take a random sample of 100 cases from 1000 deliveries that occurred in maternity hospital in the last year. He has taken one random number out of 1 and 10 say, 5. Then he took a case having ID No.5. Then he took cases having ID numbers 15,25,35.45.....995 as his sample. What method of sampling the researcher adopted here?

The research has adopted **systematic sampling.** Why? Interval

Study No. 3

Consider one more hospital where 1000 MI cases were reported last year. He wants to do a study one these cases. As these number of cases is large, he wants to take a sample of 100 cases. And also, as the physiological parameters of these cases would be different in overweight and less weight cases, the researcher wants to divide these 500 MI cases into two groups one with overweight/obese(that is BMI>=25) cases and the other less weight(BMI<25) cases and that both these groups to represent in his sample of 100 cases. Then he took a sample of 50 patients at random from each of these two groups.

➔ **What are these two groups called in sampling?**

These groups are called **strata in sampling.**

➔ **What is the sampling method adopted here to select a sample of 100 cases?**

This method of sampling is called **stratified sampling**.

➔ **Why did the researcher adopt this sampling method?**

He adopted this sampling method because that both strata that is, overweight and of less weight cases to be represented in the sample

How To Apply Sampling Techniques

Study No. 4

It was decided to estimate prevalence of diabetes in KSA. He had limited resources. So, he divided entire KSA into 5 regions as north, south, east, west and central. Then he made 10 contiguous geographical areas in each of these five regions. Then he selected one area at random from each region. He collected data from all the eligible individuals from each selected area and he found 5000 individuals from these five selected areas. Then he collected relevant data from all these individuals.

➔ **What type of sampling method he used here?**

Cluster sampling
_ What's the keyword for cluster sampling ? All individuals

➔ **Why did he adopt this method?**

He used cluster sampling because he had **limited resources and he does not need sampling frame that is list of all the individuals of entire KSA**, which is difficult to get. It's enough if he has list of clusters, and he could collect the data from all individuals of the selected clusters only. In this way, he saves lot of resources by not traveling widely to take a simple randomness sample.

Study No. 5

Health authorities asked an epidemiologist to find out the prevalence of anemia in high school children of standard VI to X in a district of an African country. There are 60 schools in this district. And each school has standard VI to X classes. He wanted to use multistage sampling method to estimate the prevalence of anemia in high school children of standard VI to X in that district. How he would have done multistage sampling method in this situation?

First, he needs only the list of these 60 schools. In the first stage he can select 5 schools among 60 schools at random, and from each of the selected school, out of five standards VI to X, select two standards at random. This is second stage of selection. And from each of the selected standard select 20 students at random. This the third stage of selection. So our sample consists of 200 students (5x2x20). This is his sample of students from whom he has to collect data to estimate the prevalence of anemia of high school children of that district.

Research Team

RESEARCH TEAM
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Keep it simple, Keep it focused

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